an encapsulant completely enclosing the die and the heat spreader.

2. The die package of Claim 1, wherein the second surface of the die is the face containing active circuitry.

3. The die package of Claim 2, wherein the second surface of the die is electrically coupled to the first surface of the substrate.

a1

4. (Amended) The die package of Claim 3, wherein bond wires electrically couple the second surface of the die to the first surface of the substrate.

5. The die package of Claim 1, further comprising a conductive ball grid array coupled to the second surface of the substrate.

a2

6. (Amended) The die package of Claim 1, further comprising a thin layer of thermal conductive adhesive between the die and the heat spreader.

7. The die package of Claim 6, wherein the thin layer is of the order of approximately 1 mil or less.

a3

8. (Amended) The die package of Claim 1, wherein the encapsulant covering an uppermost portion of the heat spreader is no more than 9 mils thick.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

9. (Amended) The die package of Claim 1, wherein the heat spreader comprises:

an interior planar portion overlying and attached to the die;

a3 cont.

an outer planar portion overlying and attached to at least a portion of the substrate; and

a first angled portion extending from the outer planar portion towards the second surface of the die.

10. The die package of Claim 9, wherein the outer planar portion only overlies portions of the substrate in a direction extending laterally from the four sides of the die.

a4

11. (Amended) The die package of Claim 9, wherein the outer planar portion overlies substantially all of the substrate.

12. The die package of Claim 1, wherein the first surface of the die is the face containing active circuitry.

13. The die package of Claim 12, wherein the first surface of the die is electrically coupled to the first surface of the substrate.

a5

14. (Amended) The die package of Claim 13, wherein an array of solder bumps electrically couple the first surface of the die to the first surface of the substrate.

15. (Amended) The die package of Claim 9, wherein a thin layer of encapsulant is located between the outer planar portion of the heat spreader and the first surface of the substrate.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

a5 cont.

16. (Amended) A ball grid array (BGA) package, comprising:

a substrate including a ball grid array;

a die coupled to the substrate;

a thin thermal conductive adhesive layer on the die;

a heat slug attached to the die with the adhesive layer; and

an encapsulant completely covering the heat slug.

17. (Amended) The BGA package of Claim 16 wherein the encapsulant covering an uppermost portion of the heat slug is no more than 9 mils thick.

18. (Amended) The BGA package of Claim 16, wherein the heat slug comprises:

an interior planar portion overlying and attached to the die;

an outer planar portion overlying and attached to at least a portion of the substrate; and

a first angled portion extending from the outer planar portion towards [the] an upper surface of the die.

~~19. The BGA package of Claim 18, wherein a thin layer of encapsulant is located between the outer planar portion of the heat slug and the upper surface of the substrate.~~

a6

20. (Amended) A method of dissipating heat from a ball grid array package, comprising:

attaching a die to a substrate including a ball grid array;

attaching a heat slug directly to the die; and

encapsulating the die and the heat spreader completely.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

a6 cont.

21. (Amended) The method of Claim 20, further comprising leaving a thin layer of encapsulant over an uppermost portion of the heat slug.

22. (Amended) The method of Claim 20, further comprising forming a thin layer of encapsulant between an outer portion of heat slug and a surface of the substrate.

23. A method of packaging a semiconductor die, comprising:

providing a substrate;

attaching a first surface of the die to the substrate;

attaching a heat slug directly to a second surface of the die, the second surface opposing the first surface; and

completely covering the heat slug with an encapsulant.

a7

24. (New) The die package of claim 1, wherein the heat spreader contacts the first surface of the substrate.

25. (New) The die package of claim 24, further comprising bond wires electrically coupling the second surface of the die to the substrate, wherein the heat spreader superimposes the bond wires.

26. (New) The die package of claim 2, further comprising bond wires electrically coupling the second surface of the die to the substrate, wherein the heat spreader superimposes the bond wires.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

a7 cont.

27. (New) The die package of claim 26, wherein the heat spreader contacts the substrate.

28. (New) The die package of claim 27, wherein the die has four peripheral sides, and the heat spreader contacts the substrate adjacent each of the four peripheral sides.

29. (New) The die package of claim 27, wherein the die has four peripheral sides, and the heat spreader contacts the substrate adjacent some but not all of the four peripheral sides.

30. (New) The die package of claim 1, wherein the second surface of the die includes bond pads electrically coupled to the substrate, and the heat spreader contacts the second surface of the die within a perimeter of said bond pads.

31. (New) The die package of claim 30, wherein the bond pads are each electrically coupled to the substrate by one of a plurality of bond wires, and the heat spreader superimposes the bond wires.

32. (New) The die package of claim 31, wherein the heat spreader contacts the substrate outward of a connection between the respective bond wires and the substrate.

33. (New) The die package of claim 31, wherein the heat spreader does not contact the substrate.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

34. (New) The die package of claim 1, further comprising a metal ring coupled to the first surface of the substrate around the die and the heat spreader.

a7 cont.

35. (New) The die package of claim 34, wherein the die is in a flip chip connection with the first surface of the substrate.

36. (New) The die package of claim 9, wherein the second surface of the die includes active circuitry, and bond pads electrically coupled to the substrate.

37. (New) The die package of claim 1, wherein a thickness of the encapsulant between an outer surface of the encapsulant and a closest portion of the heat slug is no more than 9 mils.

38. (New) The BGA package of claim 16, wherein the die includes an active surface with bond pads thereon, the heat slug is attached to the active surface within a perimeter of the bond pads.

39. (New) The BGA package of claim 38, wherein the bond pads are electrically coupled to the substrate using bond wires, and the heat slug arches over said bond wires.

40. (New) The BGA package of claim 39, wherein the heat slug is attached to the substrate.

41. (New) The BGA package of claim 16, wherein the heat slug includes a depressed region opposite a surface of the heat slug that is attached to an active surface of the die, said depressed region being filled with said encapsulant.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979

a7 cont.

42. (New) The BGA package of claim 16, wherein a thickness of the encapsulant between an outer surface of the encapsulant and a closest portion of the heat slug is no more than 9 mils.

43. (New) The method of claim 20, wherein the heat slug is coupled to a surface of the die that includes a plurality of bond pads, said bond pads being electrically coupled to the substrate.

44. (New) The die package of claim 23, further comprising bond wires electrically coupling the second surface of the die to the substrate, wherein the head spreader superimposes the bond wires.

45. (New) The method of claim 23, wherein a thickness of the encapsulant between an outer surface of the encapsulant and a closest portion of the heat slug is no more than 9 mils.

46. (New) The method of claim 45, wherein a plurality of bond wires are electrically coupled to the second surface of the die, and the heat slug superimposes the bond wires.

47. (New) The method of claim 46, wherein a plurality of bond wires are electrically coupled to the second surface of the die, the heat slug superimposes the bond wires, and the heat slug is attached to the substrate.

LAW OFFICES OF
SKJERVEN MORRILL LLP

25 METRO DRIVE
SUITE 700
SAN JOSE, CA 95110
(408) 453-9200
FAX (408) 453-7979